

**WOODROW WILSON BRIDGE REPLACEMENT  
FINAL BRIDGE STRUCTURE BUILDING PLANS**  
City of Alexandria, Virginia, Prince George's County, Maryland  
and the District of Columbia

**Report to the Federal Highway Administration**

August 2, 2001

---

***Abstract***

The Federal Highway Administration (FHWA) has requested that the Commission review final bridge design plans to enable it to proceed with work to construct the replacement Woodrow Wilson Bridge. The current schedule calls for the outer loop of the new bridge to be completed by 2005. To accommodate this schedule, highway officials would like to begin constructing the outer loop bridge structure for the crossing in the late fall of 2001. Final design of the bridge includes plans for several of the structure's features that the Commission reviewed and commented on at the design concept and preliminary approval stage. These features are now included as part of this final bridge structure submission. The plans maintain the grace and beauty befitting this important river crossing. The FHWA will continue to work with all stakeholders, including the Commission, to refine other elements of the project that have not been submitted to the Commission at this point.

***Authority***

Pursuant to Section 5 of the National Capital Planning Act of 1952, as amended (40 USC 71d), and D.C. Code, sec. 5-432.

---

***Executive Director's Recommendation***

The Commission:

- **Commends** the Federal Highway Administration (FHWA) for the high quality of the final bridge design.
- **Approves** the final building plans for the Woodrow Wilson Bridge Replacement, as shown on NCPC Map File No. 3206.00(48.20)-40932; and

- **Requests** that, in the preparation of subsequent plan submissions for ancillary elements of the Woodrow Wilson Bridge Replacement project, the FHWA:
  - Present design information on the visual graphics and signage that is to be utilized at both the Urban Deck and Potomac River Community Park as a “gateway announcement” at each end of the Wilson Bridge.
  - In the development of the three project amenity areas (the Urban Deck, Jones Point Park, and Potomac River Waterfront Community Park), ensure a high standard of design for all light fixtures, structures, and signage.

\* \* \*

## **BACKGROUND AND STAFF EVALUATION**

### *DESCRIPTION OF PROPOSAL*

The Federal Highway Administration (FHWA) has submitted final design plans for the Woodrow Wilson Memorial Replacement Bridge (Wilson Bridge). The Wilson Bridge carries Interstate 95/Interstate 495, the Capital Beltway, across the Potomac River. The bridge replacement and related highway improvements extend from Telegraph Road on the west to Maryland Route 210 (Indian Head Highway) on the east. The new bridge as designed will be 6,075 feet long and consist of twin parallel structures, one measuring 124 feet wide and the other measuring 110 feet wide.



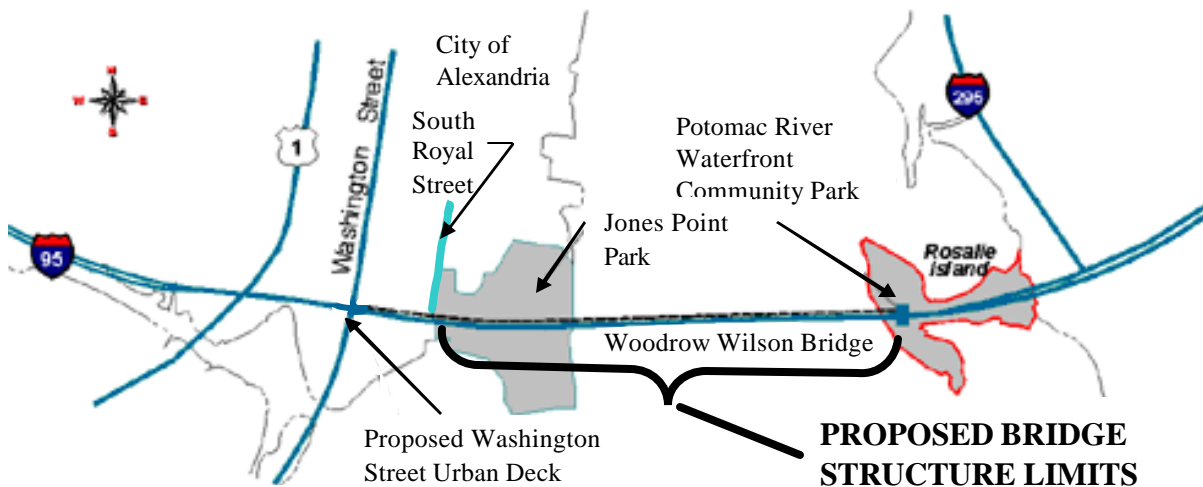
**AERIAL VIEW OF EXISTING WOODROW  
WILSON BRIDGE**

Originally constructed as a national memorial bridge to former President Woodrow Wilson, our 28<sup>th</sup>

President, the existing six-lane bridge was opened to traffic in 1964 to accommodate approximately 75,000 vehicles per day. Today, over 190,000 vehicles use the bridge daily.

According to the Final Supplemental Environmental Impact Statement (FSEIS), construction will occur in several stages. They are:

- Start of the construction access, dredging, and foundations in the Potomac River—by fall, 2000. This work was completed ahead of schedule.
- Begin the construction of the Woodrow Wilson Bridge (outer loop) superstructure—by 2001-2002. The current submitted plans provided to the Commission and evaluated by this report address this stage of the project.
- Begin the I-295, US 1, and MD 210 interchanges—by 2001-2002
- Begin the Telegraph Road interchange—by 2002-2003
- Complete the Woodrow Wilson Bridge outer loop—by 2004-2005
- Demolish the existing Woodrow Wilson Bridge and complete inner loop—by 2006-2007
- Complete all interchanges—by 2006-2007



### LOCATION OF WOODROW WILSON BRIDGE AND ASSOCIATED PROJECT ELEMENTS

FHWA's current submission involves only two aspects of the project:

- Final design plans for construction of the bridge, from the west abutment at South Royal Street in Alexandria, Virginia to the east abutment on the shoreline of the Potomac River at Rosalie Island in Prince George's County, Maryland.
- Final design details for signage and lighting of the bridge (roadway and aesthetic lighting).

This summer, the FHWA expects to advertise contracts related to construction of the main structure of the new bridge that will include all signs and highway lights on the bridge.

The proposed final bridge signage and roadway lighting involves development of a design to provide visual clarity while complementing the main bridge. Because the number and location of the signs is determined by federal and state highway safety and visibility standards, the aesthetic quality is essentially governed by their size, installation technique, and the structural integrity of the supporting elements.



**VIEW SHOWING FINAL DESIGN OF OPERATOR TOWER,  
ROADWAY LIGHTING, AND BRIDGE RAILING**

All main driver information signage on the bridge will have one consistent height on any one support structure. Both the top and bottom edges of all signs will be aligned to present a unified profile. The signs will be large with larger lettering than the current typical interstate roadway signs and conforming to recently updated standards for highway signage. The signage support structures have been simplified with diagonal truss members eliminated from the supports. The result is a consistent horizontal and vertical vocabulary of support structures, with predominant curved edges appearing at the profile end and with all backside areas of signs (including all mounting hardware) painted the same color.

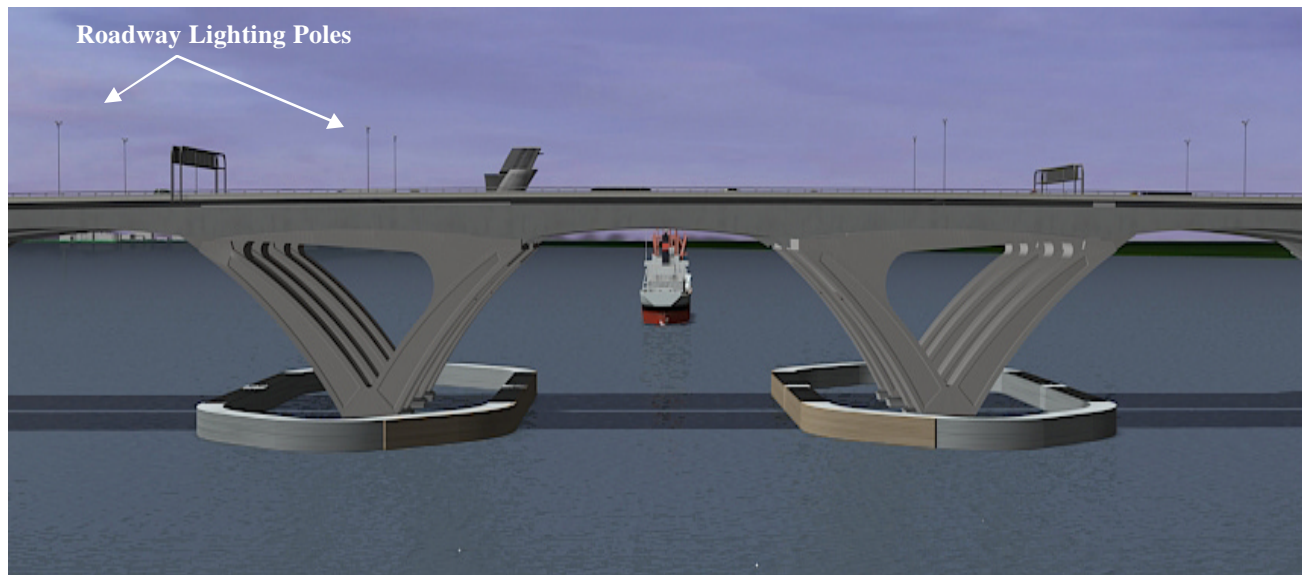
The bridge final roadway lighting design involves the principal aspects of the structural connection configuration, the number of light poles, the appearance of the light support extensions, the shape of the light fixture, and the color of emitted light. As noted above, optimization of visual clarity and coordinated aesthetic appeal are the objectives. Of significant

importance in achieving simplicity for the travel-lane lighting is the location of the light poles at the central roadway barrier of each bridge deck. Each light post will consist of opposing cantilevered arms extending outward over the travel lanes from the center pole. Based on this intention, only a single line of light posts is required for each bridge deck. The contour of the extension arms mimic the lines of the arch-shaped bridge piers, which combined with their slender lines and greater height at 45 feet, provide visual continuity for the bridge when viewed from any overall outside face and reduce the overall number of light standards required.

The final design of the bridge structure involves constructing the decking, roadway surface, railings for the new bridge, aesthetic lighting, and the abutment retaining walls at each shoreline. In this final design review, the Commission's authority extends only to the bridge but not the approach roadway interchanges or ramps.

The following describes the items included as the final building plan submission. They include:

- The final design for the replacement bridge that would function as a ten-lane crossing, with two additional lanes that can serve as High Occupancy Vehicle (HOV) lanes in the future, and that will ultimately provide the location for the placement of Metrorail.
- The decking for the main spans of the bridge. The spans consist of 18 V-shaped piers with arched or curved legs that support a concrete roadway bed and steel box girder system. The replacement bridge is 6,075 feet long. The bridge piers will be constructed of pre-cast concrete tinted to give a "monumental white" appearance. The steel box girders will be painted a lighter shade than the concrete, comparable to the color of the Lincoln and Jefferson Memorials.



**VIEW OF PROPOSED FINAL BRIDGE SPAN AND ROADWAY LIGHTING AS SEEN  
FROM THE POTOMAC RIVER**

- The final design of the twin-bridge (15 feet separation), draw span facility. The bridge's vertical clearance at the draw span, in the closed position, is 70 feet above the river's navigation channel.
- Final details of a 12-foot-wide path for pedestrians/bicyclists that is provided along the northern side of the bridge with connections to trails in Virginia (Mount Vernon Memorial Trail) and Maryland (Potomac Heritage Trail and the proposed National Harbor development walkways). Also on the north side are four overlooks, with views toward the District of Columbia Monumental Core. The overlooks will be placed on either side of the draw span, at the mid-point of the bridge, and near the Maryland shoreline.
- Final design details for a contemporary-style glass and metal (aluminum and stainless steel) Operator Control Tower that is located near the draw span approximately 15-20 feet above the road travel lanes.
- Final design of the subdued night lighting of the V-shaped piers. Illumination will achieve a light quality similar to that of other Potomac River bridge crossings. Lighting fixtures mounted in the barrier wall separating the walkway and the westbound shoulder would light the floor of the pedestrian pathway.
- Forty-five-foot-tall highway light fixtures mounted on the three-foot, six-inch traffic barrier at the central portion of each bridge span.
- The final design of overhead highway signage and supporting structures.

The submitted plans do not include project drawings for Jones Point Park, the Potomac River Waterfront Community Park at Rosalie Island, or the Urban Deck over the Beltway in the area of Washington Street (George Washington Memorial Parkway) in Alexandria, Virginia. These project elements, which are affected by the design and construction of the Woodrow Wilson Bridge Replacement, will be submitted individually as their final details are completed in the future.

As the project has been further refined through its final design process, the location of noise barriers has been determined by the States of Virginia and Maryland to be limited only to the above three project areas and not required on the main bridge structure itself.

#### *PREVIOUS COMMISSION ACTION*

The Commission approved the design concepts for the Woodrow Wilson Bridge project in April 1999, as shown on NCPC Map File No. 08.21(3200.00)-40612. The Commission requested that, in the preparation of preliminary site and building plans, the FHWA provide more detailed information and illustrative drawings for the following:

- The bridge's night lighting scheme, including the lighting of the V-shaped arched piers, the roadway deck, and the area underneath the bridge at Jones Point Park, as viewed from the Virginia and Maryland shores and the Nation's Capital.
- The texture and color of the exterior finish of the bridge, including piers, roadway deck, furniture (including railings, light fixtures, and signage), the Operator Control tower, areas underneath the bridge, and its abutments at Jones Point Park and Rosalie Island.



- Design details for the roadway deck railings, light fixtures and signage, Operator Control Tower, pedestrian/bicycle pathway along the bridge and its connections to other trails or paths in Virginia and Maryland, and potential noise barriers at each end of the bridge.
- Noise effects of the new bridge including noise impacts generated by the planned steel box girders, including any “resonance” or reverberation impacts.
- Landscape plans at the bridge abutment areas in Jones Point Park and on Rosalie Island.

The Commission, at its August 3, 2000 meeting, approved preliminary site and building plans for the Woodrow Wilson Bridge Replacement, as shown on NCPC Map File No. 3206.00(48.20)-40820 along with final foundation and Phase 1 dredging plans for the Woodrow Wilson Bridge Replacement, City of Alexandria, Virginia, Prince George’s County, Maryland, and the District of Columbia, as shown on NCPC Map File No. 3206.00(48.20)-40813.

The Commission also indicated that, in the preparation of subsequent plan submissions for the Woodrow Wilson Bridge Replacement project, the FHWA:

- Work with Commission staff in the continued design development of the light fixtures and sign structures so that they reflect the same forward-looking treatment as the bridge; and
- Coordinate the design plans for Jones Point Park and the related overpass urban deck in Virginia, and Rosalie Island (Potomac River Waterfront Community Park) and the Beltway overpass deck in Maryland with the City of Alexandria, Prince George’s County, and the Commission prior to submission.

The Commission at its March 1, 2001 meeting:

- Commended the FHWA for the high quality of the preliminary design featured in the plans for the Urban Deck at Washington Street, Jones Point Park, and the Potomac River Waterfront Community Park as part of the Wilson Replacement Bridge. The Commission encouraged FHWA to ensure that the harmonious designs it has developed are carried through to their completion.
- Approved the preliminary site and building plans for the urban deck overpass at Washington Street and improvements to Jones Point Park in Alexandria, Virginia, and development of the new Potomac River Waterfront Community Park at Rosalie Island in Prince George’s County, Maryland, as shown on NCPC Map File No. 2501.00(38.00)-40893. Excepted from the approval were the gateway sentinel elements at Potomac River Waterfront Community Park, which the Commission understands have been deleted from the project, and the restroom/maintenance buildings at Jones Point Park and Potomac River Waterfront Community Park, which are approved in concept only.
- Requested that, in the preparation of subsequent plan submissions for the Woodrow Wilson Bridge Replacement project, the FHWA:
  - Provide, as the Commission earlier requested, complete details on the Wilson Bridge

project noise barriers as they relate to the three amenity areas.

- Present more design information on the visual graphics and signage that is to be utilized at both the Urban Deck and Potomac River Community Park as a “gateway announcement” at each end of the Wilson Bridge.
- In the development of the three amenity areas (the Urban Deck, Jones Point Park, and Potomac River Waterfront Community Park), ensure a high standard of design for light fixtures and signage.

### *CONSULTATION*

All of the submitted final site and building plans have been successfully coordinated by FHWA and its consultants with the local jurisdictional governments, public interest groups, and state agencies. The FHWA continues its coordination efforts with the National Park Service. Unanimous approvals from the Alexandria City Council, on December 18, 2000 and the Prince George’s County Planning Board, also in December 2000, have been secured for the bridge design plans.

Additionally, in early April 2001, FHWA met with NCPC staff to review the Commission’s request for further information on bridge railings, signage design, interpretive elements, and the travel-lane lighting proposed for the Woodrow Wilson Bridge Replacement project.

### *EVALUATION*

**The staff recommends that the Commission approve the final building plans** for the Woodrow Wilson Bridge Replacement. Substantial and important progress has been made in the design of the bridge since the Commission’s August 2000 review. The final design plans successfully balance the bridge’s monumental aspirations and the pragmatic qualities of a transportation facility. It is apparent that FHWA’s efforts have resulted in a harmonious design that integrates the final bridge design details into a complete coordinated physical presence. We commend FHWA for its work to ensure the plans and construction materials are of the highest quality and that architectural detailing contributes to the monumental character of the final bridge design.



**VIEW OF TYPICAL INFORMATIONAL SIGNAGE IN THE FINAL  
BRIDGE DESIGN**



This submission of the final construction plans suggests a high quality and an advanced design for the roadway light fixtures and sign structures on the bridge. The drawings for the deck and railing elements, as well as the final building plans for the Bridge Operator Control Tower, maintain the level of exceptional design, coordination, and execution.

As a final note, staff recommends the Commission urge FHWA to continue working closely with the National Park Service, affected local jurisdictions, and the Commission on the remaining portions of the bridge's ancillary elements that are not included in this submission. In particular, we look forward to reviewing the preliminary site and building plans for the Urban Deck, Jones Point Park in Alexandria, Virginia, and the Potomac River Waterfront Community Park at Rosalie Island, Prince George's County, Maryland.

### *CONFORMANCE*

#### Coordinating Committee

The Coordinating Committee reviewed this item at its meeting on July 11, 2001, and forwarded the proposal to the Commission with the statement that the project has been coordinated with all agencies participating. The participating agencies were NCPC; the District of Columbia Office of Planning; the Fire Department; the Department of Housing and Community Development; the General Services Administration; the National Park Service; and the Washington Metropolitan Area Transit Authority.

#### National Historic Preservation Act

A Memorandum of Agreement (MOA) for the proposed Woodrow Wilson Bridge Replacement was signed in October and November of 1997. The signatories were FHWA (the lead agency), NPS, the Advisory Council on Historic Preservation, and the State Historic Preservation Offices for Virginia, Maryland, and the District of Columbia. The signatories and other parties are continuing to consult on specific aspects of the project as they are developed. The City of Alexandria and the Maryland-National Capital Park and Planning Commission (M-NCPPC) are continuing to be active participants in review of the project (including those aspects pursuant to the MOA).

The Design Review Working Group (DRWG), composed of the signatories and affected local jurisdictions and chaired by the Advisory Council on Historic Preservation, meets regularly to review plans developed by the project team.

FHWA and NPS determined that the bridge project would have an adverse effect on the Alexandria Historic District, Jones Point Lighthouse, the District of Columbia South Cornerstone, and two shoreline archaeological resources within Jones Point Park. In addition, the bridge project was determined to have an effect on the Mount Vernon Memorial Highway/George Washington Memorial Parkway. The signatories also agreed that the project might have an effect on the Freedmen's (Contraband) Cemetery in Alexandria.

The MOA contains numerous stipulations on the documentation and treatment of known and of potential historic or archaeological resources during the construction of the bridge. The signatories also agreed to certain goals during the design and review of the project. In addition, the bridge design and other project elements are to take into account the historic plan of the Mount Vernon Memorial Highway and NPS's General Management Plan for the facility; the agreement between NPS and the City of Alexandria for the management of Jones Point Park and its resources; the agreement with the Daughters of the American Revolution for the management of Jones Point Lighthouse; and effects on archaeological resources.

The MOA also stipulates that the project is to be designed to avoid all temporary and permanent impacts to the Freedmen's (Contraband) Cemetery. In the current project plans, improvements in the Freedmen's Cemetery are limited to filling and re-grading the area behind the proposed I-95 wall beyond the west end of the bridge; this grading will provide a more level area for future improvements in the cemetery and adjacent area, including a proposed pathway to Church Street. The Friends of Freedmen's Cemetery (Friends) is a volunteer group that has been working closely with project planners in the development of proposals for this historic resource and the immediate area. The City of Alexandria is supportive of the Friends' role and expertise in this regard.

Specifically for Jones Point Park, the signatories developed goals for the treatment of the seawall, the D.C. Cornerstone, the slipway, and for interpretation of the historic features of the park. An archaeological investigation has been completed and plans for the park are in development.

The developing plans for connections through and across Rosalie Island and for the community park are the subject of ongoing review by representatives of the DRWG from the Maryland Historical Trust, M-NCPPC, and Prince George's County.

#### National Environmental Policy Act

Pursuant to the regulations implementing the National Environmental Policy Act (NEPA), the FHWA prepared a Final Supplemental Environmental Impact Statement (FSEIS) and Record of Decision for the Woodrow Wilson Bridge project. These documents were prepared in April and June 2000, respectively.

On June 16, 2000, NCPC issued its own FEIS which adopted the FHWA FSEIS relating to NCPC's authority for review and approval of this proposed action. The purpose of the FEIS was to identify potential environmental impacts, as defined by CEQ regulations, resulting from the Woodrow Wilson Bridge project. The FEIS examined alternatives to the proposed action and the impacts of those alternatives. The FEIS also addressed mitigation of adverse resulting effects from the alternatives. NCPC elected to adopt the existing April 2000 FSEIS pursuant to Section 1506.3 of the CEQ regulations. This adoption was accomplished through staff review and approval of the FHWA document. The adopted FEIS was available to the public for review more than thirty days before Commission action.

The submitted final building plans are in conformance with all decisions arrived at and documented in the NEPA process.

### Endangered Species Act

Pursuant to the Endangered Species Act (ESA), the FHWA entered into formal Section 7 consultation with U.S. Fish and Wildlife Service (USFWS) and prepared a Biological Assessment that was submitted to USFWS on September 22, 1999. That document quantifies the extent of direct and indirect impacts to bald eagle habitat as a result of the proposed project. USFWS issued a Biological Opinion on April 14, 2000, characterizing the anticipated effects of the Woodrow Wilson Bridge project on bald eagle habitat and identifying the terms and conditions for appropriate mitigation of these adverse effects. The provisions below are nondiscretionary, and must be implemented by FHWA, so that they become binding conditions for the exemption in Section 7(o)(2) to apply. The stipulations include:

- Construction must be timed to significantly reduce the risk of eagle nest abandonment on the adjacent Betty Blume Park (M-NCPPC ownership).
- Retaining the wooded shoreline on Rosalie Island and reducing the limits of disturbance to the northern portion of the island that includes Maryland State Highway Administration and NPS lands.

The Biological Opinion provided by USFWS to FHWA indicates that implementing protective measures during construction associated with fish passage improvements in Rock Creek Park as a project mitigation action will avoid the incidental take of the Hay's Spring Amphipod found in Rock Creek Park. The Biological Opinion also includes other requirements that authorize proceeding with the project provided that the agency adheres to the terms and conditions of the Biological Opinion. The final building plans adhere to these stipulations.

The National Marine Fisheries Service requested a Biological Assessment of the Shortnose Sturgeon that determined the probability of the presence of the species in the vicinity of the Woodrow Wilson Bridge project to be very low. Nevertheless, time-of-year restrictions on the use of underwater blasting and mitigation measures for removal of debris and bridge demolition activities will be implemented during bridge construction.

### Federal Capital Improvements Program

This project is included in the Federal Capital Improvements Program Fiscal Years 2002 – 2007, adopted by the Commission on July 3, 2001. The total project cost in the currently identified program is \$2 billion.

### Comprehensive Plan

At the final design and construction stage, the proposed replacement bridge would affect the Potomac shoreline and floodplain, wetlands, ambient noise levels, and would generate spoil

materials. Policies in the Environment Element of the Comprehensive Plan applicable to these impacts specify:

If construction in a Floodplain is necessary, (1) the site should be returned as close as possible to its natural contours; (2) Floodplain fill should be minimized; (3) grading requirements should be minimized; and (4) free natural drainage should be preserved.

Land uses adjacent to Wetlands should be compatible with the preservation of natural resources supported by the Wetlands.

Highway development design should be sensitive to existing and proposed adjacent land uses and should employ the use of barrier attenuations, where necessary.

Spoil materials generated during construction of Federal and non-Federal facilities should be re-used, where possible, on site. If the materials are disposed of elsewhere, it should be done in accordance with local regulations.

Policies contained in the Parks, Open Space and Natural Features Element apply to shoreline protection and the preservation and enhancement of river views and state:

Natural shoreline areas in the National Capital Open Space System should be retained in their natural condition or be appropriately landscaped for a distance of 150 to 200 feet from the water's edge, if possible. Large paved parking areas and other non-water related development should be discouraged within the area.

The Y-shaped composition of open water spaces created by the confluence of the Potomac and Anacostia Rivers in the L'Enfant City and its environs should be treated as an urban river setting. Development in this area should preserve and enhance the variety of views and vistas proposed in the L'Enfant and McMillan Plans, respect the grand scale of the river landscape, and allow for the appreciation of the extensive areas of water landscape. Docking areas and waterfront buildings should be integrated with the generally low and continuous line of river embankments.

The Oxon Hill Children's Farm in Prince George's County and Bellehaven Park on the Virginia side of the Potomac River are located in the vicinity of the proposed bridges and their river views would be affected.

The proposed bridge would require easements for construction on Jones Point Park, Rosalie Island, the Mount Vernon Memorial Highway, and on some of the land for the Potomac Heritage Trail. Jones Point Park and Rosalie Island are federally owned and are designated for Natural Park use in the Comprehensive Plan. The Mount Vernon Memorial Highway is a designated national landmark, a Gateway to the Nation's Capital and is part of the George Washington Memorial Parkway. The following additional policies from the Parks, Open Space and Natural Features Element apply:

Natural Parks...should be established, protected, and maintained to ensure the conservation and enhancement of the significant features of the National Capital.

The George Washington Memorial Parkway should be maintained as a scenic corridor which not only serves as a spectacular Gateway artery to the Nation's Capital, but which also preserves its important historic associations. Its scenic, historic, and recreational aspects should be emphasized and protected, even at the expense of its traffic-carrying role.

The proposed Potomac Heritage Trail, to be part of the National Trail System extending from the Chesapeake Bay to the Appalachian Trail north of the Region and beyond, should be developed using the existing and proposed trails within the National Capital Open Space System as much as possible.

Two additional policies in this element relating to bridge design and the protection and enhancement of Gateways also apply:

Bridges over rivers and streams should be designed to retain the natural continuity of waterways, shorelines and valleys. Whenever possible, bridges and their approaches should enhance the sense of arrival, gateway or transitional qualities inherent in river crossings.

Roadways in the Interstate Highway System are important Gateways used by Visitors and should be maintained in a manner which protects and enhances their landscape character and quality, gives attention to scenic views from the road, and provides informative signs to assist Visitors. Advertising signs and bordering development should be carefully controlled to avoid adverse visual impacts.

The bridge proposal would also require an easement for construction in the Alexandria Historic District. An applicable policy in the Preservation and Historic Features Element specifies:

New construction on Historic Landmarks or in Historic Districts should be compatible with the historical architectural character and cultural heritage of the landmark or districts. In design, height, proportion, mass, configuration, building materials, texture, color and location, new construction should complement these valuable features of the landmark or district, particularly features in the immediate vicinity to which the new construction will be visually related.

All aspects of the final site and building plans for the Woodrow Wilson Bridge Replacement demonstrate consistency with the above policies of the Comprehensive Plan for the National Capital.

Technical drawing of a bridge structure, showing a side elevation and a detail view.

**Side Elevation:**

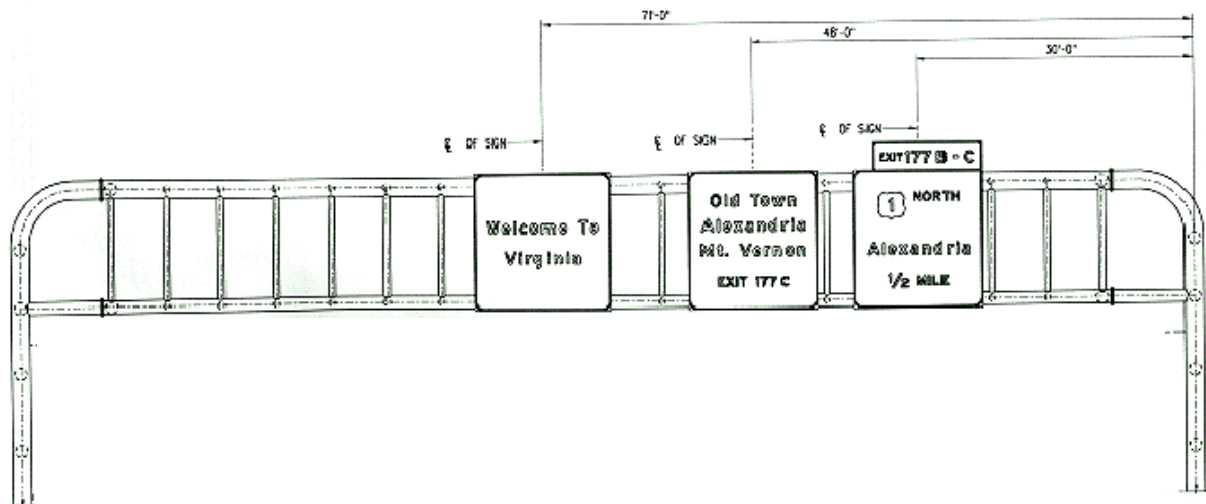
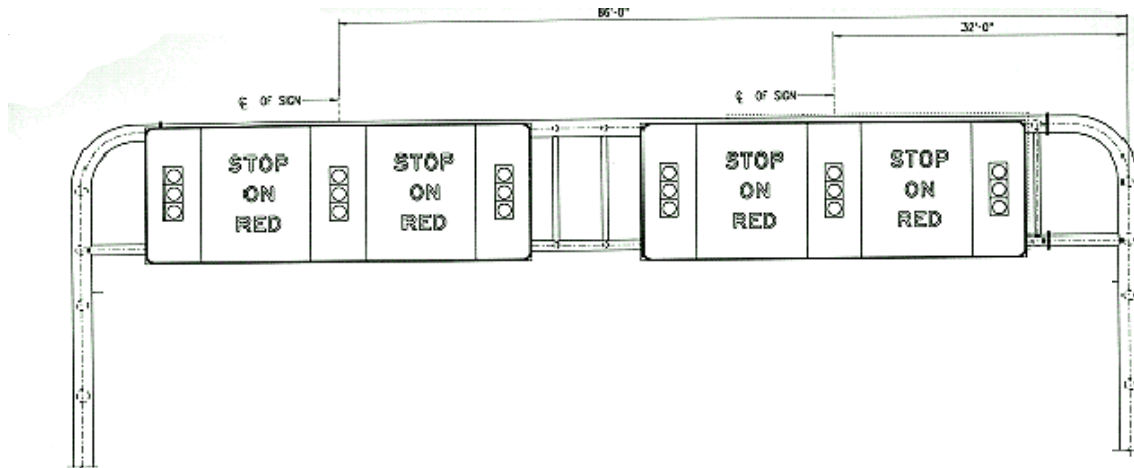
- Span: 128'-0"
- Supports: Poles (labeled "POLE")
- Top Structure: 24" DIA. PIPE (TYP)
- Middle Structure: 12" DIA. PIPE (TYP)
- Support Cable: 1/2" DIA. SUPPORT CABLE
- Deck: TOP OF ROADWAY
- Hinges: SELF-ALIGNING HINGES
- Energy Absorber: ENERGY ABSORBER DRACNET MODEL MAF 4K75A
- Net Assembly: DRACNET JAWB2 NET ASSEMBLY

**Detail View:**

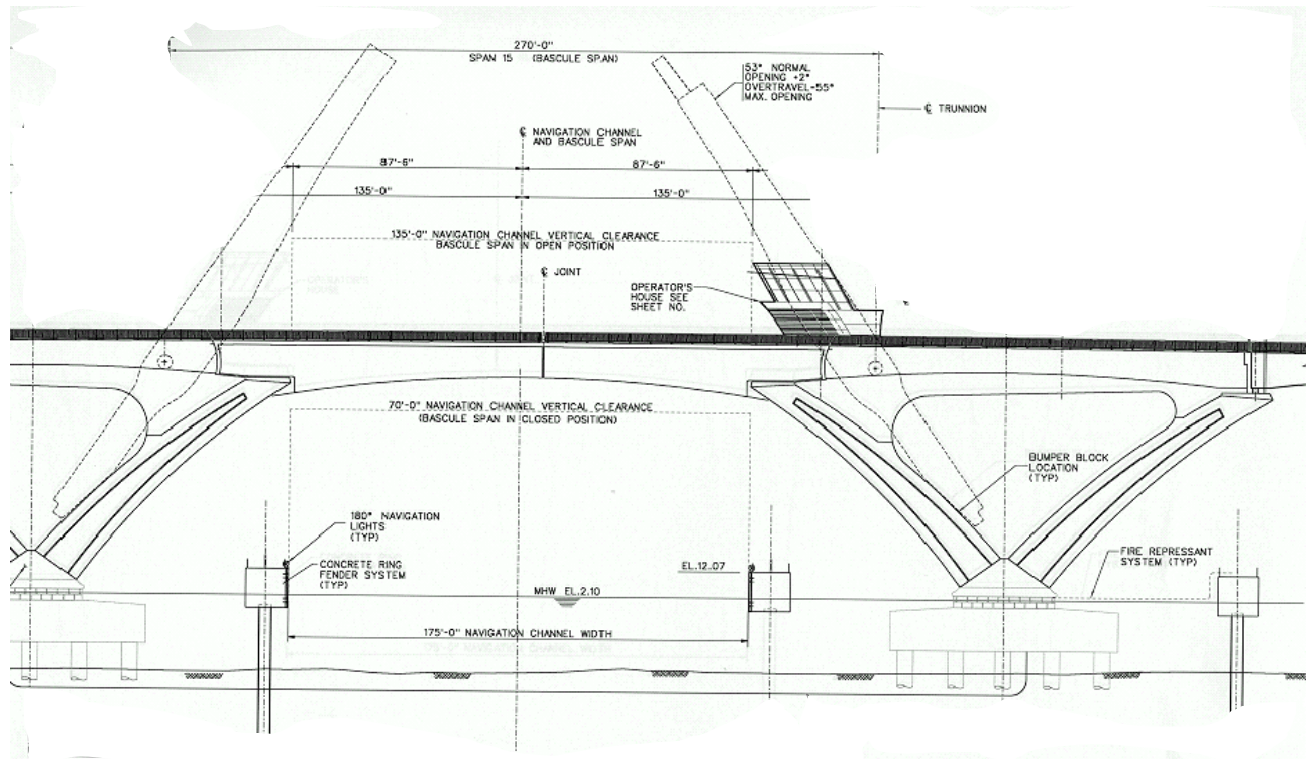
- Top Structure: 24" DIA. PIPE (TYP)
- Middle Structure: 12" DIA. PIPE (TYP)

## DRAW SPAN VEHICLE BARRICADE NET

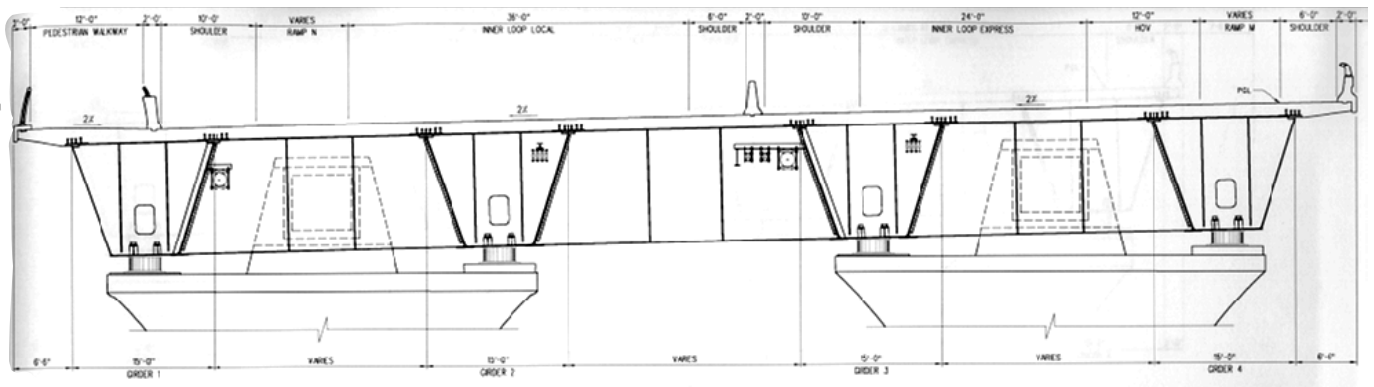




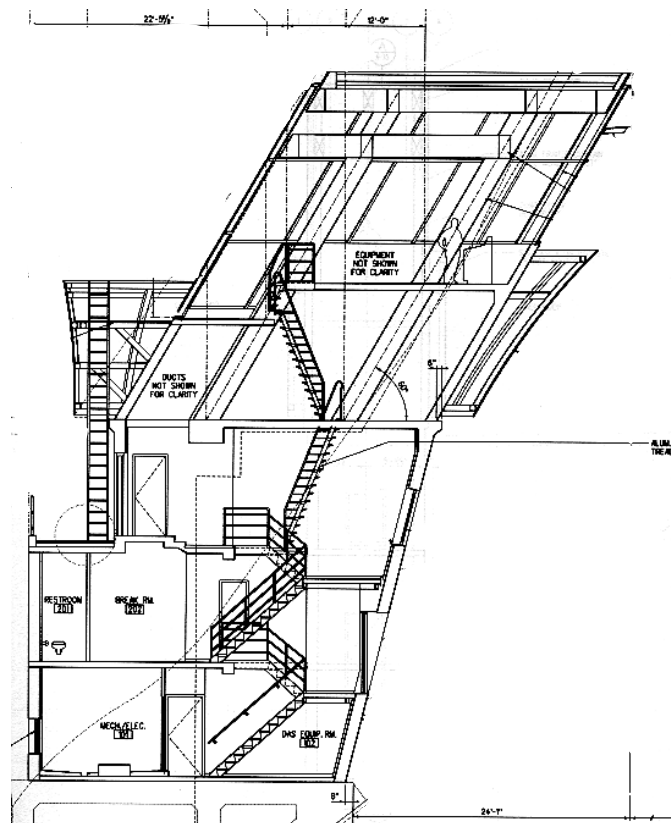
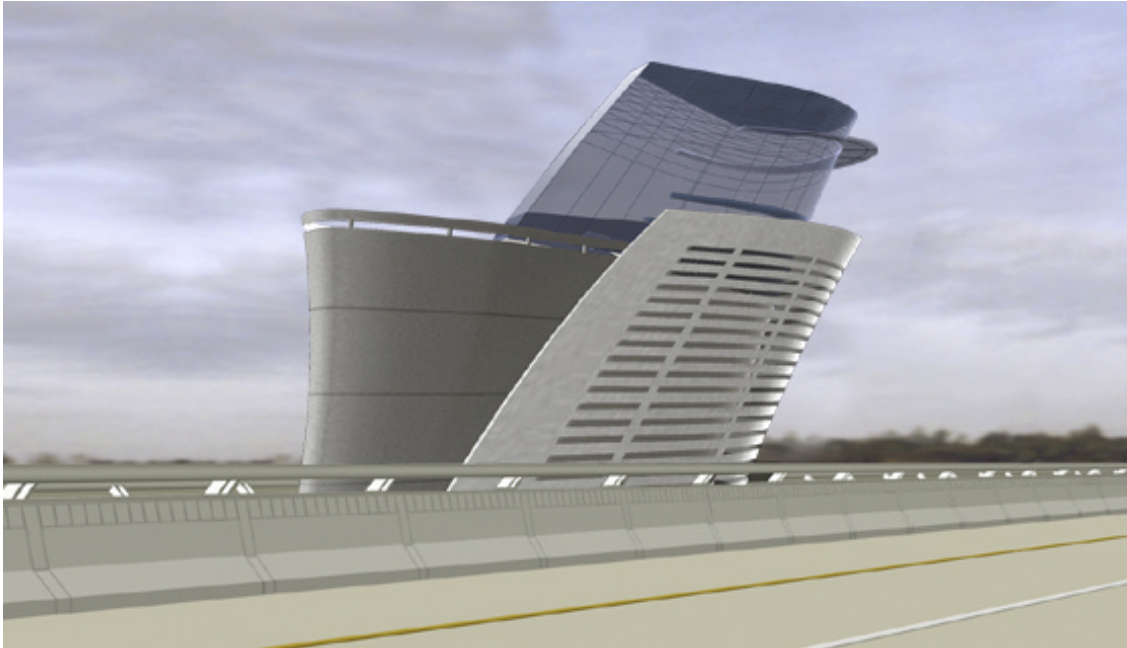
## BRIDGE SIGNAGE DETAILS



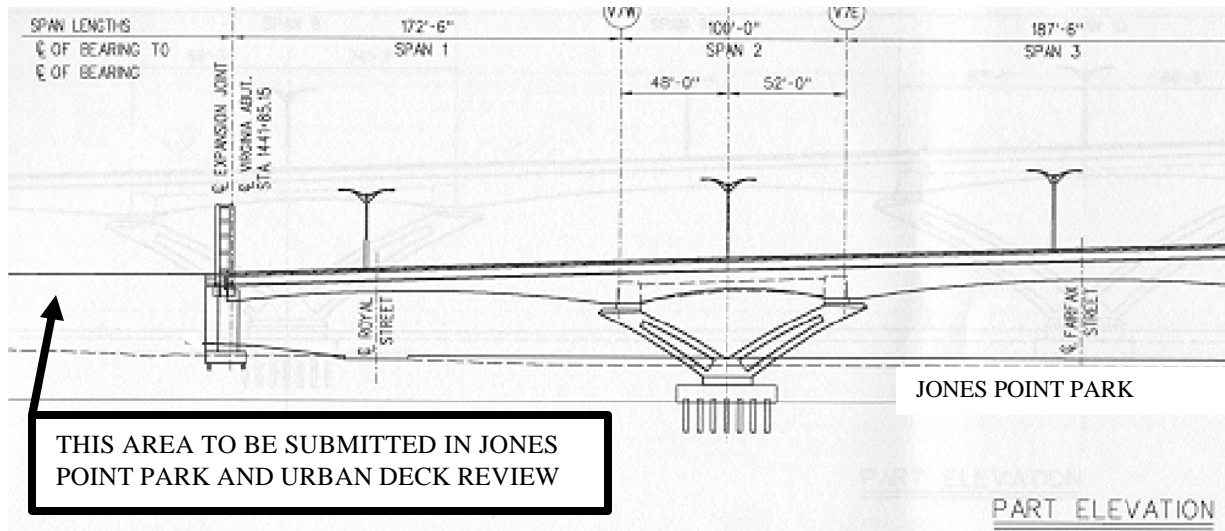
**DETAIL OF DRAW BRIDGE SPAN WITH OPERATOR TOWER**



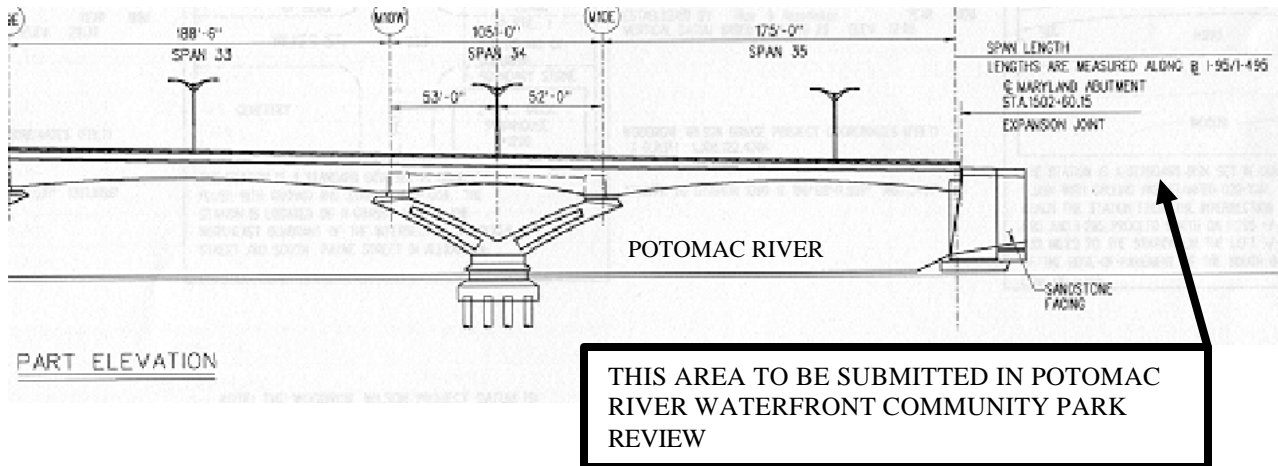
**BRIDGE DECK AND ROAD CROSS SECTION**



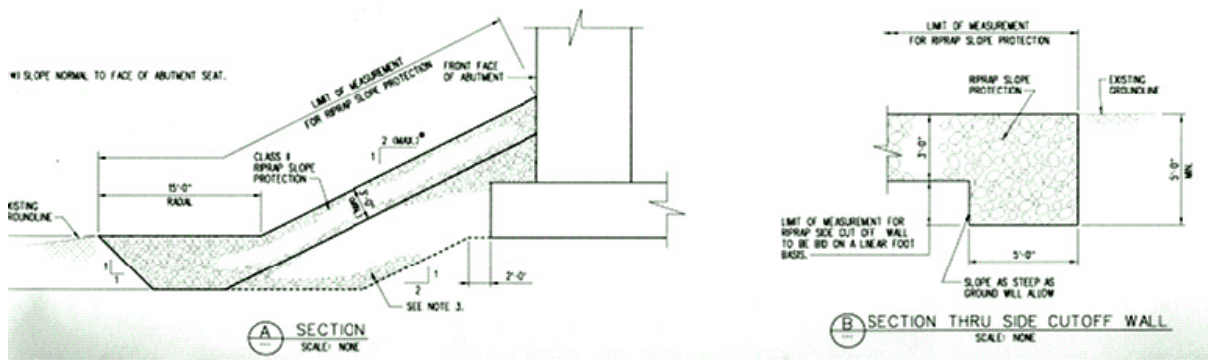
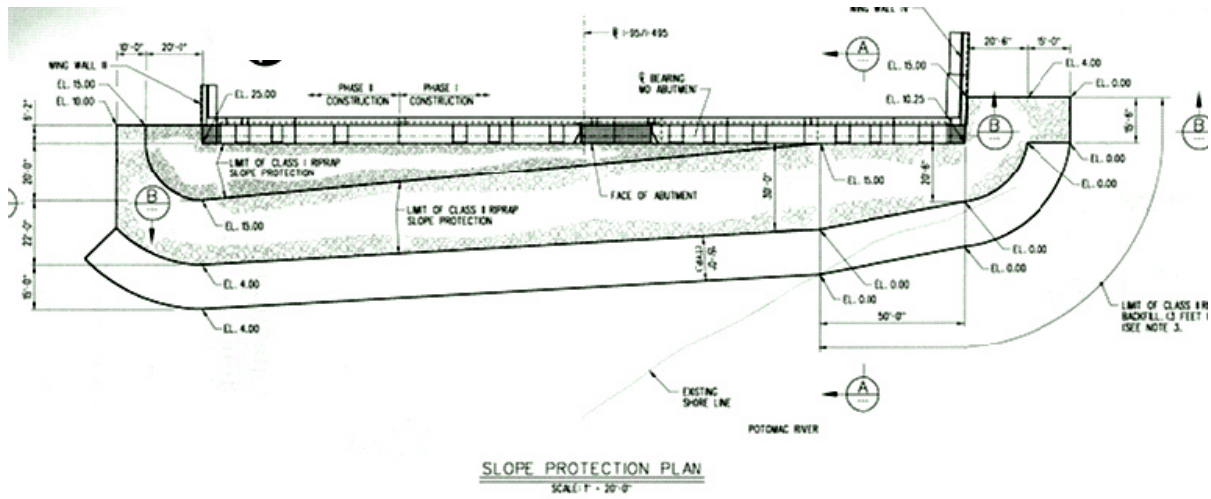
**BRIDGE OPERATOR TOWER DETAIL VIEW AND SECTION**



### VIRGINIA BRIDGE ABUTMENT



### MARYLAND BRIDGE ABUTMENT



## MARYLAND SHORELINE ABUTMENT SLOPE PROTECTION

